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environmental assessment
construct boat dock

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APOSTLE ISLANDS

NATIONAL LAKESHORE / WISCONSIN

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ENVIRONMENTAL ASSESSMENT

CONSTRUCT BOAT DOCK

APOSTLE ISLANDS NATIONAL LAKESHORE

(PACKAGE NO. 224)

Prepared by:

United States Department of the Interior
National Park Service
Denver Service Center

March 1987

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U.S. Department of the Interior
National Park Service
Environmental Assessment
Construct Public Boat Dock, Michigan Island
Apostle Islands National Lakeshore
Ashland County, Wisconsin

Summary:

The National Park Service proposes to construct a new boat dock and perform minor shoreline stabilization at Michigan Island. At the present time there are no docking facilities available on the island. Boats must be landed on the shoreline and this practice is considered inefficient, very hazardous, and results in increased negative impacts to island natural and cultural resources. Shoreline stabilization work would help to slow the natural erosion which is occurring in the proposed docking area. This would help to prolong the useful life of the new dock. With the installation of a dock, island visitation is projected to increase from a present 50 per year to about 3,000 per year. Island disturbances from dock construction and increased visitation may result in negative impacts to bald eagle nesting attempts. Installation of steel piles may result in the irretrievable loss of an undetermined amount of bedrock.

Address Comments to:

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TABLE OF CONTENTS

PURPOSE AND NEED..1

AFFECTED ENVIRONMENT...3

DESCRIPTION OF ALTERNATIVES..7

ENVIRONMENTAL CONSEQUENCES...9

CONSULTATION/COORDINATION/REFERENCES/PREPARERS...................12

GRAPHICS

Project Location Map...8

PURPOSE AND NEED

The National Park Service proposes to construct a new boat dock and perform minor shoreline stabilization work in Apostle Islands National Lakeshore at Michigan Island. A new dock is needed to provide a safe and efficient method for access onto the island. Stabilization work is necessary to help protect the shoreline which is being eroded by natural forces. This shoreline protection would help to extend the useful life of the new dock and would assist in protecting island natural and cultural resources.

Historically there was a large timber crib-type dock at Michigan Island that served the lighthouse complex. Storms and age resulted in the destruction of this dock and for many years the island has been without a safe and efficient method of access onto it.

Visitors and park staff now access the island by "beaching" their boats near the historic Michigan Island Lighthouse complex, the major island attraction, or a nearby sandspit (cuspate foreland). This method of access is inefficient, hazardous, and discourages island visitation. Supplies, materials, and equipment must be loaded and unloaded over the bows of boats. This is only feasible during calm weather and is considered unsafe even then.

It takes approximately one hour to boat from Bayfield, Wisconsin, the location of park headquarters, to Michigan Island, a 17-mile one-way trip. Weather throughout the region can change suddenly and storms are often severe and destructive. These storms are principally from the northwest, northeast, west, and southwest and often result in damage to natural and man-made features along the lakeshore. Michigan, being one of the outer islands in the Apostle Island archipelago, receives the brunt of many of these storms. These sudden changes in weather conditions can make island access difficult. Waters just a few feet offshore can be cold enough to cause hypothermia in only a few minutes.

The beaching of watercraft results in negative impacts to natural and cultural resources. Landing boats near the lighthouse or on the sandspit encourages the use of these fragile areas. Sandspit vegetation is being trampled and nearby historic sites are being misused. Artifacts are being illegally scattered, collected, and destroyed.

Severe shoreline erosion is occurring throughout the entire Lake Superior basin. Current water elevation levels are at a 125 year record high. Michigan Island is experiencing damage to natural and cultural resources from these high water levels. Clay bluffs on the eastern and southern sides of the island are experiencing severe erosion problems. Vegetation on these bluffs is being destroyed. The lower portion of a historic concrete tramway/stairway which connects the shoreline to the lighthouse complex on the bluff above has been damaged. Other historic structures are not currently threatened.

The lighthouse complex is staffed by a park volunteer who lives at the site for approximately 4 months of the year, June through September. The volunteer gives interpretive tours of the lighthouse complex, performs minor maintenance, and collects scientific data on island flora and fauna. Volunteers are rotated to provide them with some "time-off" on the mainland. This requires a regular boat pick-up/drop-off service which is provided by lakeshore staff.

AFFECTED ENVIRONMENT

NATURAL RESOURCES

Geology and Soils

Apostle Islands National Lakeshore, located on the Bayfield Peninsula of Northern Wisconsin, is comprised of a mainland unit and 21 islands along the southwestern shore of Lake Superior. Michigan is one of the outer islands in this archipelago. The island is semi-elongated, running northeast to southwest and is 1,564 acres in size. Michigan's bedrock is comprised of red sandstone and the predominant soil type is a reddish silty clay loam. The shoreline is characterized by moderate to steep slopes. Littoral drift of shoreline sediments occurs along the northwest and southeast sides of the island and nourishes an extensive sandspit at the southwest end.

Historically, there was a large beach adjacent to the lighthouse complex. Several years of high precipitation and runoff and low evaporation rates have resulted in record high Lake Superior water levels. Wave action and high water levels have eroded most of the beach. Sand accumulates during periods of mild winds and surf, but as the weather becomes more severe, sand drifts southwestward exposing boulder, cobble, and gravel deposits. The clay bluffs on the eastern and southern sides of the island are also experiencing severe wave and runoff erosion.

Vegetation

Vegetation throughout the shoreline ecosystem is limited with no plants present in the proposed construction zone. Sandspit vegetation is sparse and includes beach grass, beach pea, wild rye, and evening primrose.

Michigan is one of three of the Apostle Islands with natural bodies of freshwater on them. Lagoons and bogs formed by barrier beaches are located close to the northeastern and southwestern ends of the island. Dominant vegetation in these areas include cattails, alder, and willow.

Forest vegetation in the lakeshore is a dense mixture of deciduous northern hardwood forest and southern boreal forest. Common trees include sugar maple, yellow and white birch, trembling aspen, hemlock, white cedar, hemlock, black spruce, tamarack, and balsam fir. Forest understory is dominated by yew. The forest floor is varied, with abundant wildflowers, mosses, and ferns.

Vegetation within the historic lighthouse complex consists of non-native turf grass. Originally planted by the early lighthouse keepers, this lawn is maintained to help preserve the appearance of the historic complex.

Wildlife

Wildlife species on Michigan Island are also characteristic of the boreal and northern hardwood forests. Numbers, species, and distribution vary between the mainland and the islands. Black bear and whitetailed deer have been seen swimming between the mainland and among the islands. Other animals may do so as well. Coyotes and red fox are the major predators. Snowshoe hare are common on most of the islands.

Bird species are diverse and also typical of this "mixed forest" ecosystem. The physical topography of the Bayfield Peninsula and the Apostle Islands acts to funnel birds on their spring and fall migrations. The islands are also in the transition zone of many northern and southern species. In 1977, 62 breeding species of birds were identified on Michigan Island.

Aquatic wildlife species are characteristic of waters of good quality. The shallow waters in and around the lakeshore are used as spawning grounds for some types of Lake Superior fish. Fish species include native lake trout, menominee whitefish, and lake herring, and also the exotic smelt, brown and rainbow trout. Atlantic, coho, pink, and chinook salmon have recently been introduced into Lake Superior. It is unknown whether these species inhabit the waters off Michigan Island; however, coho and chinook are found throughout the islands' waters.

Threatened and Endangered Species

There are no federally listed threatened or endangered plant, fish, amphibian, snail, mussel, crustacean, or insect species known to inhabit the Apostle Islands National Lakeshore. The State of Wisconsin's List of Endangered and Threatened Species has identified 13 plant species that inhabit the lakeshore, however none have been found on Michigan Island.

Federally and state listed threatened and endangered bird species known to inhabit Michigan Island include the threatened (endangered on the state list) bald eagle (*Haliaeetus leucocephalus*) and the endangered American peregrine falcon (*Falco peregrinus anatum*). Bald eagles have nested on Michigan Island in the past few years. An eagle nest located near the north end of the island was inactive in 1986, but produced young in 1985 and may do so again. Peregrine falcons have been seen within the lakeshore but are considered only rare migrants. No nesting has been documented. No other federally or state protected animal species are known to frequent or inhabit the island.

Floodplains and Wetlands

Under the NPS final procedures for implementing Executive Orders 11988 "Floodplain Management" and 11990 "Protection of Wetlands" (47FR36718), actions which are functionally dependent on water are excepted from compliance with these orders.

It will be necessary to obtain a federal 404 and a state permit for construction of the dock. A "Joint State/Federal Application for Water Regulatory Permits and Approval" form, design drawings, and a copy of this environmental assessment will be submitted by the National Park Service, Denver Service Center to the Wisconsin Department of Natural Resources.

Section 307 of the Coastal Zone Management Act (CZM) of 1972 requires that all activities of federal agencies significantly affecting the coastal zone be undertaken in a manner consistent with the state's approved coastal zone management program. Wisconsin's program received federal approval in 1978.

The National Park Service has determined that construction of the proposed dock would be in accordance with Wisconsin's CZM Plan. State CZM concurrence will be sought during the state permit application process.

Water Resources

Lake Superior has the largest surface area of any freshwater lake in the world encompassing an area of about 31,652 square miles. Its volume of 2,935 cubic miles is second only to Lake Baikal in Siberia. Overall current movement in Lake Superior is counterclockwise around the periphery of the basin. Major cyclonic eddies occur in the Duluth-Silver Bay-Apostle Islands region. In the Apostle Islands, surface current is largely controlled by wind. Winds off Michigan Island from about N. 80° E. to due west characteristically produce the highest and most damaging waves.

Lakeshore jurisdiction over Lake Superior waters extends 1/4 mile from the shore of each island.

Winter ice conditions vary with temperature, snowfall, and wind. Freezeup normally occurs in January and continues into March.

The waters of Lake Superior have historically been significant for commercial and sport fishing. Bacteriological water quality is considered excellent, but some contamination has occurred and continues to occur, from deposition of acid rain, PCBs, DDT, and other pollutants such as heavy metals. Minor deterioration of water quality occurs near harbors and marinas from boat exhausts and petrochemical spillage.

Water transparency in the Apostle Islands is somewhat lower then that observed in other near shore zones of Lake Superior.

CULTURAL RESOURCES

A Midwest Archeological Center (MWAC) evaluation of the proposed construction area has determined that no archeological resources would be encountered/impacted from dock construction or shoreline stabilization. This evaluation is based on previous survey work and what is known of the area. No further archeological work is needed.

The proposed site for the new dock is within the lakeshore's designated historic management zone. The primary management emphasis in this zone is "preservation, protection, and interpretation of cultural resources and their settings."

The Michigan Island Lighthouse complex, which encompasses about 2 acres of land, is situated on a bluff approximately 300 feet from the proposed dock construction site. This historic complex is currently listed on the National Register of Historic Places and consists of a lighthouse constructed in 1857 and eight associated structures. Potential impacts to this property would be mitigated in accordance with the National Historic Preservation Act.

Other historic island features, none of which have been inventoried, include a railroad logging camp and landing and fish camp, all of which are on or near the sandspit. The close proximity of these resources to the present boat landing area encourages visitors to walk through and over these sites.

The park would prepare an Assessment of Effect Form (XXX) to address the impacts of the proposed new dock on island cultural resources. The Midwest Regional Office would initiate consultation with the Advisory Council on Historic Preservation (ACHP) and the Wisconsin State Historic Preservation Office (SHPO) in accordance with the Cultural Resources Management Guidelines (NPS-28).

SOCIOECONOMIC ENVIRONMENT/VISITOR USE

Visitation to Michigan Island is very weather-dependent and is limited due to the hazards of landing a small boat during inclement weather. The island receives approximately 50 visitors a year from June through September. Many other boaters cruise by the island, viewing it from offshore. The major island attractions are the historic lighthouse complex and an extensive sandspit. Sandspits and beaches of the lakeshore have been traditionally been used for camping, picnicking, and boat landings. Island visitor use facilities are limited to vault toilets. There is a concrete and wooden tramway/stairway which leads visitors up the steep bluff to the lighthouse grounds. Concrete walkways run between most of the buildings. There are no formal campgrounds or improved trails. Wilderness-type camping is authorized by permit only.

A boat excursion is offered within Apostle Islands National Lakeshore and is operated by the lakeshore's excursion tour concessioner. Michigan Island is not a designated stop, however a dock could change this. Currently, access to the island is by private boat or concession-operated water taxi. The cost for the taxi service is approximately $100 per round trip.

DESCRIPTION OF ALTERNATIVES

ALTERNATIVE A - NO ACTION

Under this alternative the proposed new boat dock would not be constructed at this time. Access onto the island would still be accomplished by landing boats on the shoreline near the lighthouse or on the nearby sandspit.

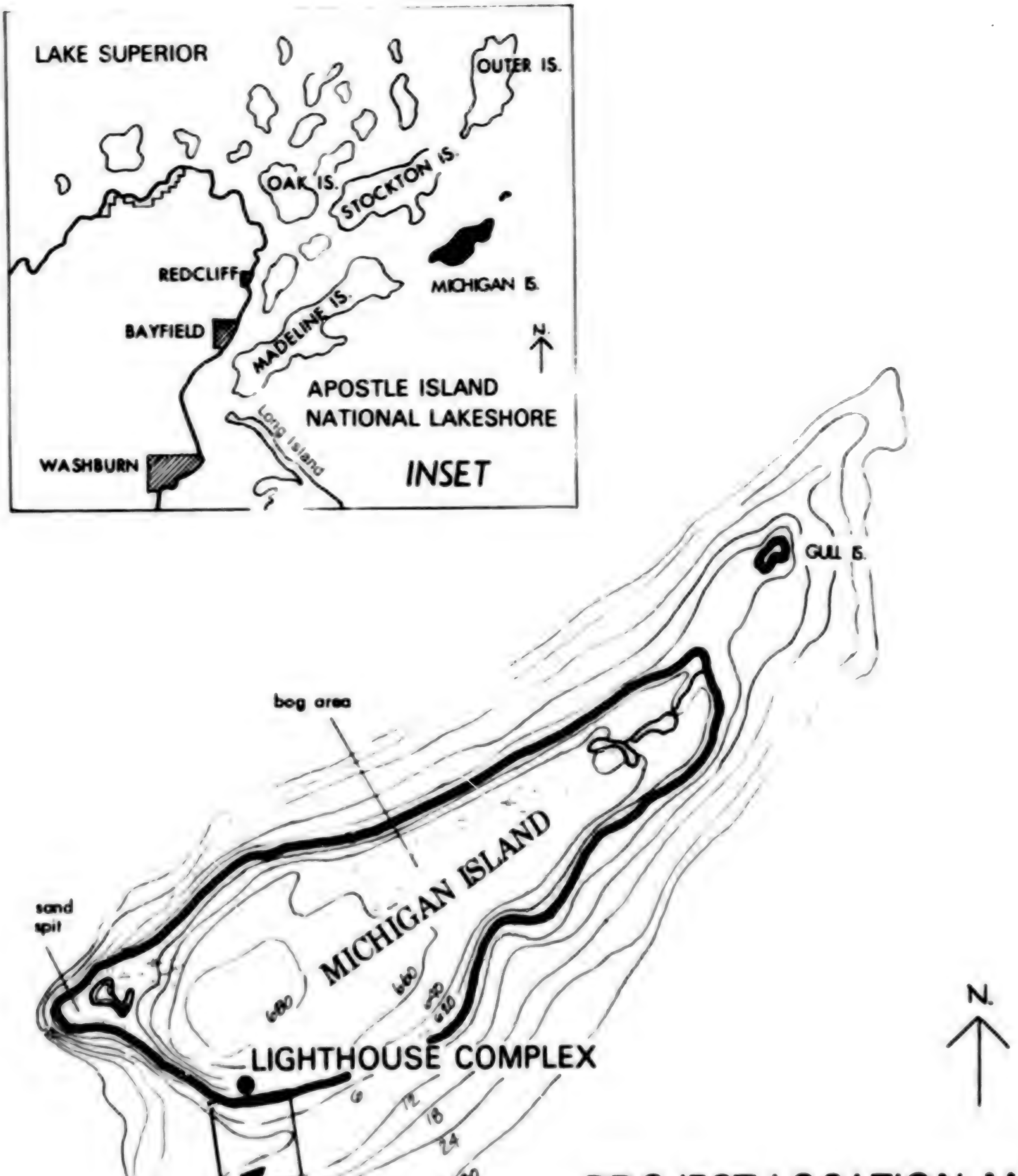
ALTERNATIVE B - CONSTRUCT BOAT DOCK (PREFERRED)

A new boat dock would be reconstructed in the waters adjacent to the lighthouse complex (see project location map). It would be constructed as a fixed dock primarily of concrete and steel. This new dock would be of either granular-filled sheet pile or steel binwall with a 8-inch concrete deck, approximately 16-feet-wide by 200-feet-long. Riprap stone would be placed around the perimeter of the dock for protection. The lake end of the dock would extend about 50 feet parallel to the shoreline to provide a protected mooring area for boats. The dock would be located in front of the existing tramway. This tramway would be extended to provide convenient access on and off the new dock.

Minor shoreline stabilization work would be performed by applying stone riprap along the shoreline and embankment in the area of the proposed dock construction site. This riprap would be placed approximately 100 feet in either direction of the existing tramway/stairway. This layer of stones would reduce the amount of erosion occurring in this area.

ALTERNATIVES CONSIDERED BUT REJECTED

Alternate construction sites were considered for a dock on the western shore of the island. This area offers a little more natural protection from the major storms, however, these sites are up to a mile from the lighthouse complex and adjacent to a wetlands area. Island visitors and park staff would have to hike across the island to reach the lighthouse complex requiring the construction and maintenance of a trail. The movement of supplies, materials, and equipment would be difficult and would require some type of vehicular transport. The likelihood of disturbance to nesting birds and other wildlife would increase, as would potential for damage to fragile sandspit vegetation and wetland area. For these reasons, a new dock at these alternate sites was considered impractical. Note: Increased visitation (from 50 to 3,000) may also cause disturbance to nesting birds and other wildlife particularly nesting eagles located on the northeast tip of the island and double-crested cormorants and herring gulls located on Gull Island.



PROJECT LOCATION MAP

CONSTRUCT BOAT DOCK MICHIGAN ISLAND

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ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE A - NO ACTION

Natural Resources

With no boat dock, island visitors would continue to land their boats on the beach or nearby sandspit. Fragile low-growing vegetation would continue to be damaged. Natural shoreline erosion would not be slowed.

Cultural Resources

The historic logging camp and landing and the fish camp would continue to be impacted by visitors using the sandspit. Continued scattering, collection, and destruction of artifacts would result in the eventual loss of historic information.

Socioeconomic Resources/Visitor Use

The hazard of landing boats would continue, jeopardizing the lives of visitors and park staff. The potential for destruction of boats and equipment would remain high. Visitors would continue to be discouraged from landing on the island.

ALTERNATIVE B

Natural Resources

Construction of the dock would require the dredging and displacement of approximately 300 cubic yards of lake bottom sediments. This would result in a temporary increase in suspended particles in surrounding waters. Negative impacts to aquatic vertebrates and invertebrates would occur including the death and displacement of some animals. The driving of steel piles into the lake bottom may cause the fracturing of bedrock and might result in an irretrievable loss of an undeterminable amount of rock.

Littoral drift of shoreline beach sediments from east to west is prevalent in the proposed project site. A dock design using interlocking sheet steel piles can interrupt the natural shoal drift movement of shoreline sediments. Sand and other fines may accumulate on the east side of the dock and a depletion of sediment may occur on the west side. Wash-through openings would be considered in the dock design to mitigate the accumulation and deposition of sediments. Since shoreline erosion is already occurring, the new dock may slow this process.

Impacts associated with the new dock would be mainly from increases in island visitation. The projected annual increase would be from 50 to about 3,000. Most visitors come to the island to see the lighthouse complex and/or use the sandspit. Dense vegetation, bog areas, and biting insects generally discourage visitors from walking into the island interior. Negative impacts in and around the lighthouse complex and the sandspit would increase. These impacts would include trampling of vegetation, soil compaction, wildlife disturbances, litter, and noise. These impacts could result in the destruction of some vegetation, increased soil erosion, increased stress and potential death of some animals, and general degradation of island asthetics. Mitigating measures would be considered if resource degradation is observed. These measures could include the use of wooden walkways in and around the sandspit to reduce vegetation and soil impacts. Providing trash receptacles could reduce litter problems.

Construction activities as well as increases in island visitation could result in negative impacts to bald eagles. At present, human disturbance in the lakeshore appears to be minimal during the critical periods of breeding, incubation, and early hatching (March to mid-June). However, this may change for the eagles on Michigan Island with the construction of the dock. Although the eagle nest on Michigan Island was inactive in 1986, it produced young in 1985 and may again do so. Section 7 consultation would continue between the lakeshore and the U.S. Fish and Wildlife Service. If future nesting does occur, the National Park Service would take steps to protect the birds. The proposed dock construction site is approximately 3 miles from the eagle nesting area and about 2 miles from the primary foraging area. This area would be closed. The Northern States Bald Eagle Recovery Plan suggests a distance of one-quarter mile (1,320 feet) as a minimum buffer zone for human presence in both feeding and nesting areas. Signs and buoys could be used to delineate the closed area. Ranger patrols could be increased. Construction noise and the presence of construction crews (during spring and summer) could cause eagles to avoid or abandon the historic nest site during and after construction. Construction of the dock could be staged so construction activities do not take place during the critical reproductive periods (March to mid-June). This may require a 2-year construction period with associated increased costs. If construction restrictions and closures are not successful and nesting eagles are disturbed, increased stress could result in nest abandonment and/or death of fledglings. If no nesting activity is occurring, no restrictions would be imposed.

The dock would provide some protection and minor habitat for young fish and other aquatic species.

Dredging activities would cause a temporary resuspension of lake bottom sediments. Sediments at Michigan have not been tested for contaminants such as PCB, DDT, and heavy metals. However, testing done at nearby Stockton Island, the lakeshore's most heavily used island docking site, identified no lake bottom contaminants. Some temporary water quality degradation could occur near the dock from boat exhausts and leakage of petrochemicals, but they would be expected to disperse rapidly.

Cultural Resources

There is potential for the new dock to cause a visual intrusion and detract from the historic setting of the lighthouse complex. This intrusion would be from the use of a new dock design and modern materials. A dock built with the historic design and materials was considered, but higher lake levels and subsequent erosion has completely altered the historic shoreline. Also, use of the original design and materials is neither economically nor structurally feasible.

Increased visitation resulting from construction of the new dock would result in increased damage to uninventoried sites on the sandspit. Negative impacts would include increased site misuse, vandalism, and basic "wear and tear". To help reduce the potential for these impacts, the lighthouse complex would be staffed during the peak visitor season. Additional staffing and interpretive/educational signing and pamphlets could also be used. These measures would help mitigate impacts, but an inventory/evaluation/protection program needs to be developed as part of the Section 106 process.

Socioeconomic Resources/Visitor Use

Construction of the dock would allow an alternate method for landing on the island. The majority of the visitors would use the dock facility, reducing potential adverse effects caused by landing on the fragile sandspit. The new dock would encourage persons to visit the lighthouse complex, allowing more visitors an opportunity to visit the island and experience its natural and historic resources.

Even with the dock, access onto the island would still be difficult at times because of inclement weather conditions. However, the dock would allow access onto the island at times when beaching boats is not now possible and would provide a safer and more secure method of island access. The potential for boating accidents and possible injury to visitors would be reduced.

Shoreline stabilization would effectively slow the natural erosion process which would prolong the life and usefulness of the dock and tramway.

As island visitation increases, so too would the potential for increased litter, noise, and congestion. The park interpretive program would be used to help reduce these problems.

Construction of the new dock would provide a potential new stop for the concession-operated boat excursion. The new dock would also benefit the concessioner's water taxi and outfitter service by providing a more convenient island access.

CONSULTATION/COORDINATION/REFERENCES/PREPARERS

CONSULTATION/COORDINATION

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